



INTEGRATED SOLUTION FOR MOTOTRBO™

SmartPTT

- ✓ Networks of any size and topology
- ✓ System infrastructure monitoring and control
- ✓ Bridging for different radio networks



*MOTO***TRBO**™



SmartPTT – Integrated Solution for MOTOTRBO™



CORE FEATURES



RADIO DISPATCH



GPS TRACKING



WEB CLIENT



EVENTS AND
VOICE LOGGING



TEXT AND DATA
TRANSFER



MONITORING

- Real-time network infrastructure monitoring
- Graphical representation of network topology
- Repeater diagnostics and control
- Monitoring reports



SIMULCAST

- Easy cooperation for all radio system users
- Wide area coverage with minimum number of frequencies
- Real-time roaming and handover during the call



RADIO NETWORK BRIDGING

- Communication between subscribers located in different networks
- Intelligent dynamic calls routing of private and group calls
- Customizable rules for selective bridging



TELEPHONE INTERCONNECT

- Based on VoIP technology
- Support for private and group radio calls from telephone
- Dialing the phone number from the radio station or patching by the dispatcher
- Telephone calls from/to the dispatcher consoles



PTT FROM SMARTPHONES

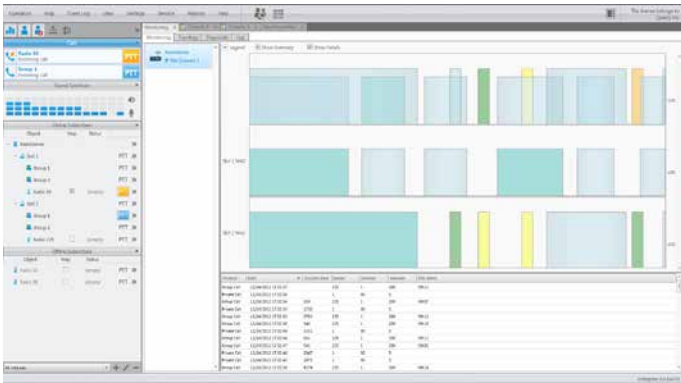
- Smartphone as a member of MOTOTRBO network
- Private, group, all calls to radios
- Text message exchange within radio system
- GPS tracking of smartphone users



DIRECT IP CONNECTION

- No control stations and sound cards
- Seamless integration of several sites into a single network
- Extended functionality of the system

Why SmartPTT?



SmartPTT Monitoring

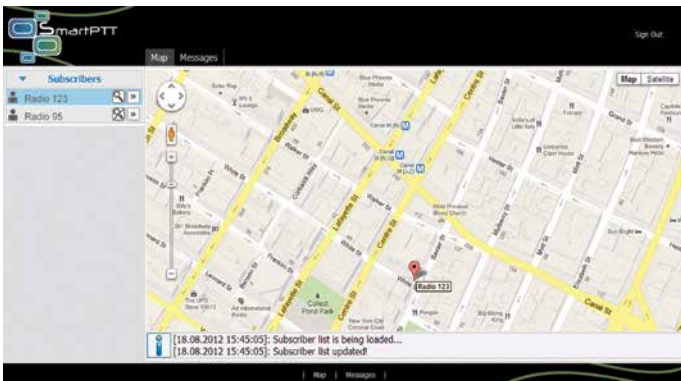
MOTOTRBO infrastructure remote control and real-time monitoring:

- Stay informed about complete system performance
- Minimize expenses for system maintenance

SmartPTT Telephone Interconnect

Seamless communication between MOTOTRBO or analog radios and telephone subscribers:

- Private and group radio calls from regular phone
- Full duplex calls from and to dispatcher console
- Voice calls recording in MP3



SmartPTT Web Client

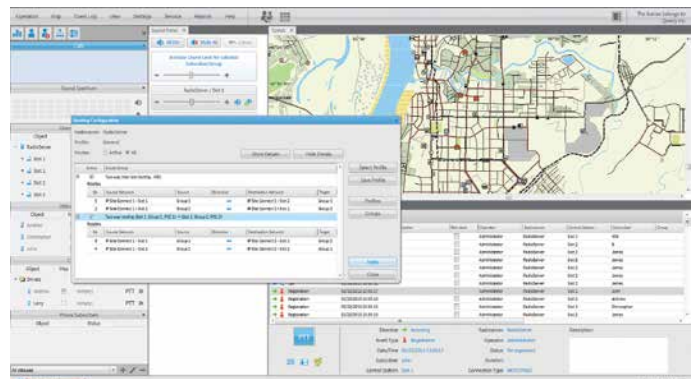
Manage fleet anywhere from SmartPTT web-based application:

- Make voice calls
- Track subscribers over the map
- Exchange text messages
- Check online/offline statuses

Radio Network Bridging

Separate radio networks turn into a single communication infrastructure:

- Interconnection of geographically distributed sites
- Intelligent dynamic routing of private and group calls
- Seamless migration from analog to digital technology



SmartPTT System Design

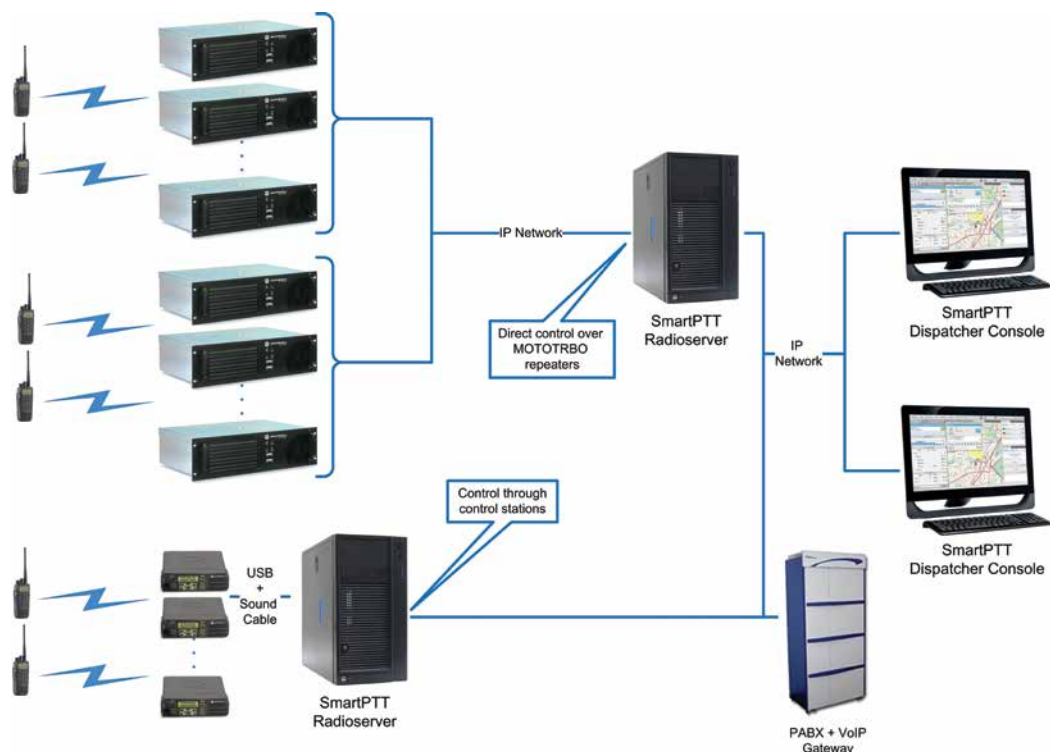
SmartPTT is designed on the base of flexible client-server technology that allows user to build dispatch control system with an unlimited number of dispatch consoles, exercising control over any number of networks.

SmartPTT Dispatch Console is a software application that provides dispatcher with all the system functionality and radio network control.

- Dispatch over the networks through radioservers
- Connection to the radioservers over the Internet or via dedicated IP-channels
- Can be located at any distance from the controlled networks
- Installation of any radios is not required at the dispatcher console
- Supports simultaneous connections to multiple radio servers

SmartPTT Radioserver provides an interface between radio networks subscribers and dispatch consoles, and also implements some functionality of the system.

- Interface to radio network via control stations or via IP-connection to the repeaters
- Telephone interconnect
- Email gateway
- Configurable operator profiles to limit their access to the system
- Each Radioserver can simultaneously serve multiple dispatch consoles



! Please Notice

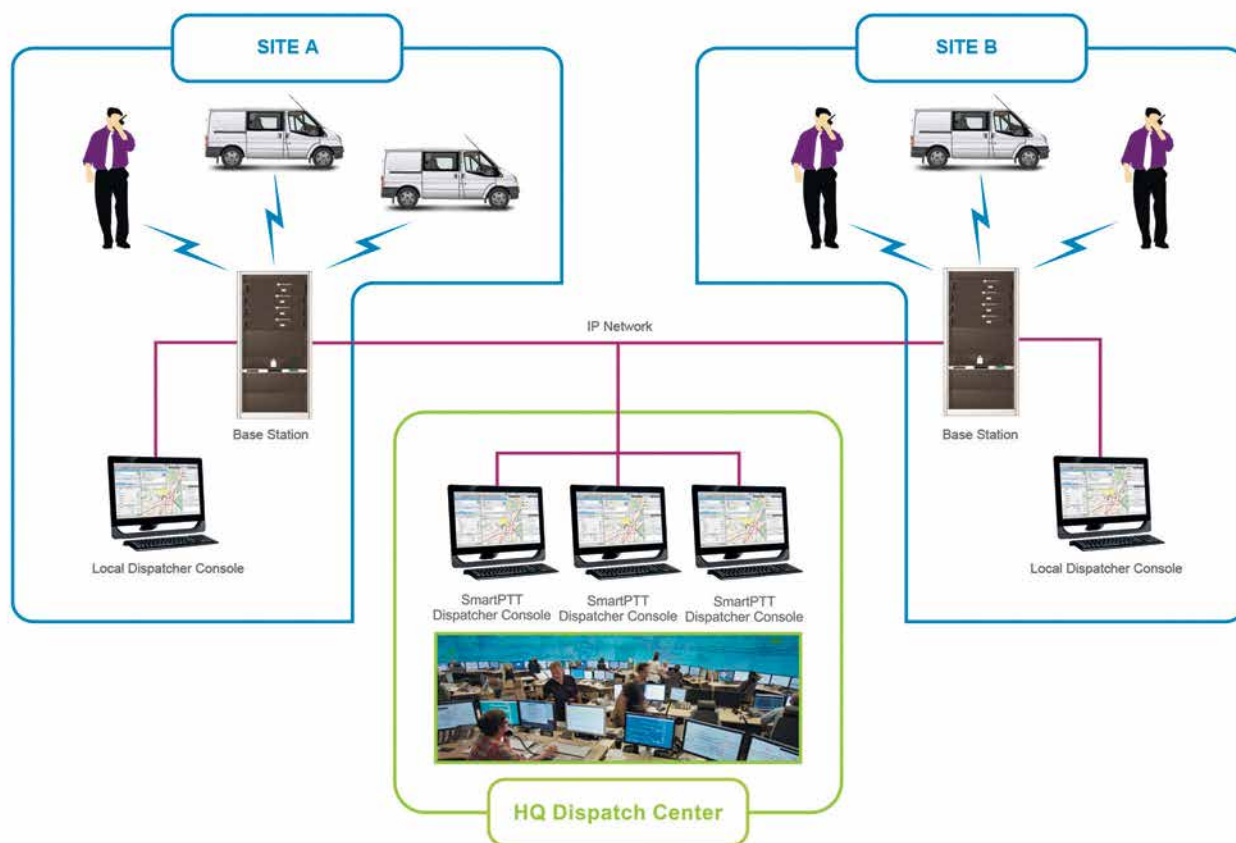
SmartPTT Dispatcher Console consists of ordinary Windows-based PC and SmartPTT software only. Installation of any radios is not required at the dispatcher console.

The interface in the radio network can be implemented in two ways:

- «Classic» approach based on control stations: one or more (up to 15) control stations are connected to radioserver via special cables. Voice calls and data transfer commands are processed through these radios.
- Direct connection to MOTOTRBO repeaters via IP-channels: Radioserver may be at any distance from controlled radio networks, no additional stations required, that simplifies deployment and reduces system cost. One Radioserver can be connected to an unlimited number of repeaters.

SmartPTT supports:

- Digital conventional networks
- MOTOTRBO IP Site Connect
- MOTOTRBO Capacity Plus
- MOTOTRBO Connect Plus
- Analog radio networks



Architecture details

- Dispatch console can be simultaneously connected to unlimited number of radioservers
- Radioserver can serve unlimited number of dispatch consoles simultaneously
- Distributed storage of event log and calls records
- Dispatcher can be launched in offline mode (without connection to radioserver)

! Please Notice

SmartPTT allows the use both of the digital features of MOTOTRBO two way radios and analog mode to facilitate gradual upgrade to the new radio communication standard by means of a «mixed» mode of operation when some sites operate in an analog mode and others operate in digital.

Direct IP Connection to MOTOTRBO repeaters

SmartPTT Enterprise introduces the most efficient way for dispatch control over MOTOTRBO systems based on direct IP connection to the repeaters. SmartPTT direct IP connection is applicable for all dispatching functionality including voice calls.

Reliability

SmartPTT dispatch system based on direct IP connection doesn't need any control stations and sound cards installed at the Radioserver. The Radioserver itself can be located at any distance from radio coverage and only requires stable IP connection to MOTOTRBO repeaters.

Scalability

With direct IP connection single SmartPTT Radioserver can handle multiple distributed MOTOTRBO systems over large distances providing seamless integration of different sites into a single radio network. Multilevel bridging feature allows establishing routes between SmartPTT Radioservers providing ability of bridging between independent dispatching systems located in different regions.

Cost-effectiveness

Systems based on SmartPTT direct IP connection allow considerable reduction of costs eliminating the need for control stations, extra server computers, and extra sound devices.

Functionality

Enhanced Logging. Only direct IP connection based system has the ability to log all voice calls and text messages including private ones and collect the information about the repeater used for transmissions.

Support of Digital Telephone Patch. With the direct IP connection to IP Site Connect systems SmartPTT supports Motorola Digital Telephone Patch providing SIP interface to telephony and ability to do simultaneous phone calls to MOTOTRBO subscribers on both IP Site Connect slots.

Monitoring. SmartPTT Monitoring service provides in-depth analysis and control over connected MOTOTRBO repeaters via direct IP connection.



Simulcast Support

SmartPTT brings extended dispatch functionalities to simulcast DMR networks with support for Radio Activity simulcast base stations. This technology allows simultaneous voice call broadcast by a number of repeaters on a single radio frequency so that several repeaters operate as one.

Simulcast network provides wider area coverage with fewer frequencies, assures real-time roaming and handover during a call and unifies all network users in one communication team. SmartPTT is fully compatible with RadioActivity solution.

Benefits:

- Reduction of frequency license costs
- Easy conference call organization
- Integrated communications for all services in case of emergency

Radio Activity
Solutions

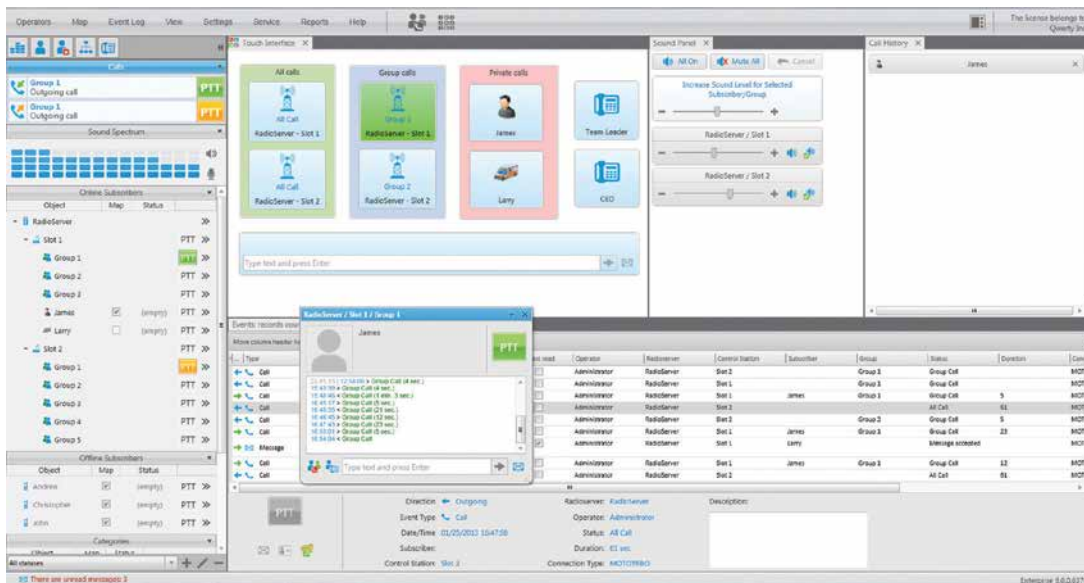


Radio Dispatch

- All type of calls (Private, Group and All call) from Dispatch Console
- Calling Subscriber Identification
- Remote Monitoring
- Emergency Calls
- Voice calls and text message exchange between dispatchers (Intercom)
- Voice Recording
- Radio Check
- Call Alert
- Radio Kill
- Voice announcements
- Flexible sound control
- Customizable Subscriber Call windows
- Subscriber categorization
- Configurable profiles to manage access of dispatchers to control stations, groups, services, MOTOTRBO IP Site Connect slots

SmartPTT Dispatcher Console supports 4 subscriber types or dispatcher voice communication:

- MOTOTRBO Subscriber Radios (individual, group, all calls)
- Analog Subscriber Radios (all calls)
- Telephone Subscribers (full duplex voice connection by SIP-protocol)
- Other SmartPTT Dispatcher Consoles (full duplex voice connection)



Subscribers of all types, Control Stations and Groups can be arranged in the flexible Category tree. Each subscriber can belong to multiple categories simultaneously. In addition the set of custom subscriber properties can be defined for every subscriber. This feature allows users to have business specific subscriber attributes, for example vehicle type, vehicle id, etc.

Interface of SmartPTT Dispatch Console is specially developed to be highly customizable.

- “Drag & Drop” support for adjusting the position and size of the panels
- Custom consoles – you can create the most suitable for you dispatch console interface by means of embedded designer
- Multi-touch screen support



Monitoring

SmartPTT Monitoring is a tool for in-depth analysis and control over connected MOTOTRBO infrastructure. SmartPTT Monitoring allows checking the performance of dispatcher system, providing the following information.

- RSSI – received signal strength
- Type of transmission: ARS, GPS, Text, Voice Call, Emergency, etc.
- Transmission duration
- Caller and Receiver IDs
- Repeater ID

Supported MOTOTRBO Systems

- IP Site Connect
- Capacity Plus
- Standalone repeater

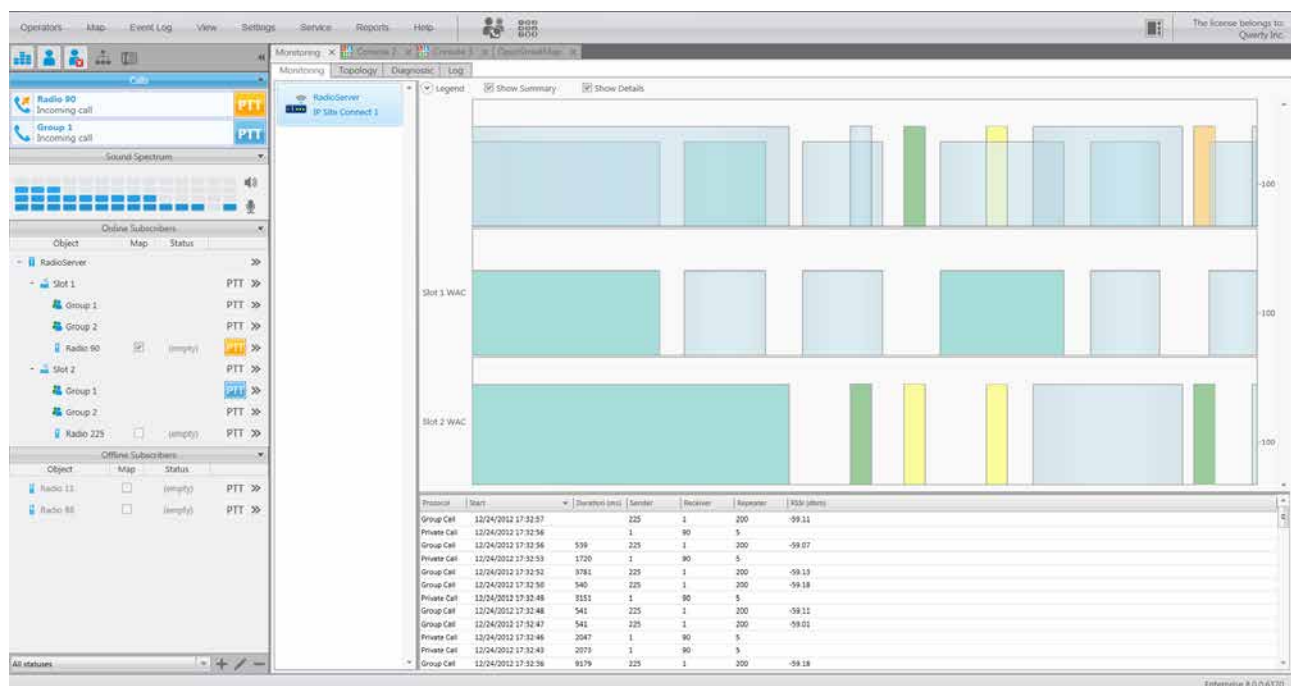
Supplied in 2 variants

- Service inside SmartPTT Enterprise
- Independent product

SmartPTT Monitoring Functionality

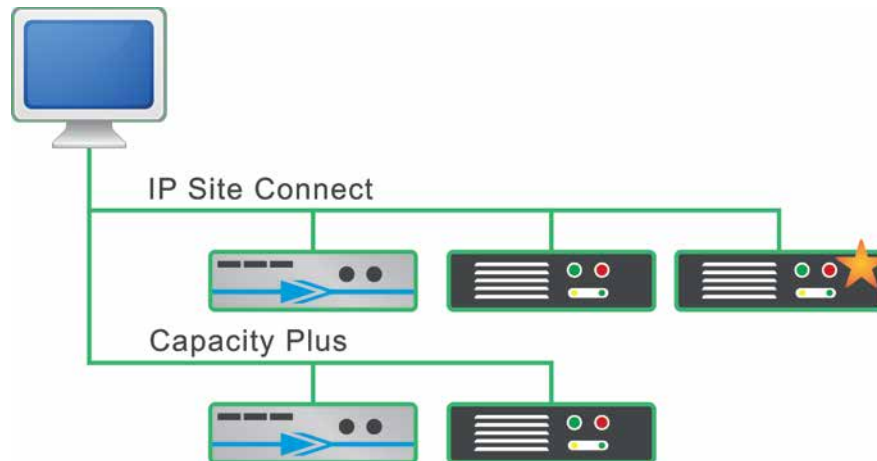
Real Time Monitoring

Graphical representation of voice and data activity received from MOTOTRBO repeaters allows watching over the system in real time. Flowing bars representing the activity and signal level are displayed for each connected channel individually and in aggregated view. The bar height corresponds to the received signal strength.



Network Topology

Graphical representation of radio network schema. Topology is defined by means of Radioserver Configuration tool and presented in the dispatcher console displaying network structure and workload percentage of each repeater. Network structure includes all MOTOTRBO repeaters and software peers arranged in accordance with the specific of the connected systems. Each Capacity Plus or IP Site Connect system is represented by separate branch with the number of corresponding repeaters.



Hardware Diagnostics

Information about current state of connected MOTOTRBO repeaters

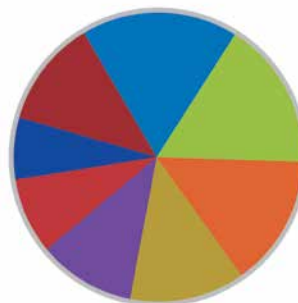
- | | | | |
|----------------|---------------------|---------------------|------------------|
| ■ IP Address | ■ Firmware Version | ■ Rx/Tx Alarm | ■ Fan Alarm |
| ■ Model Number | ■ Rx/Tx Frequencies | ■ Temperature Alarm | ■ AC Power Alarm |

Monitoring Analytics

Graphical representation of the collected monitoring data

- | | |
|--|--|
| ■ Proportions of event duration during a chosen time frame and per day | ■ Proportions of voice and data activity per day during a chosen time period |
|--|--|

- | |
|----------------------|
| ● 16.18% - System |
| ● 16.36% - ARS |
| ● 12.73% - TMS |
| ● 10.91% - Telemetry |
| ● 9.09% - Calls |
| ● 7.27% - Phone |
| ● 5.45% - Alert |
| ● 5.46% - Emergency |



Monitoring Reports

Detailed report based on collected monitoring data and filtered by number of criteria. Report provides information about MOTOTRBO repeater radio ID, source and destination subscriber radio ID or talk group ID, event duration, event type, RSSI, etc.

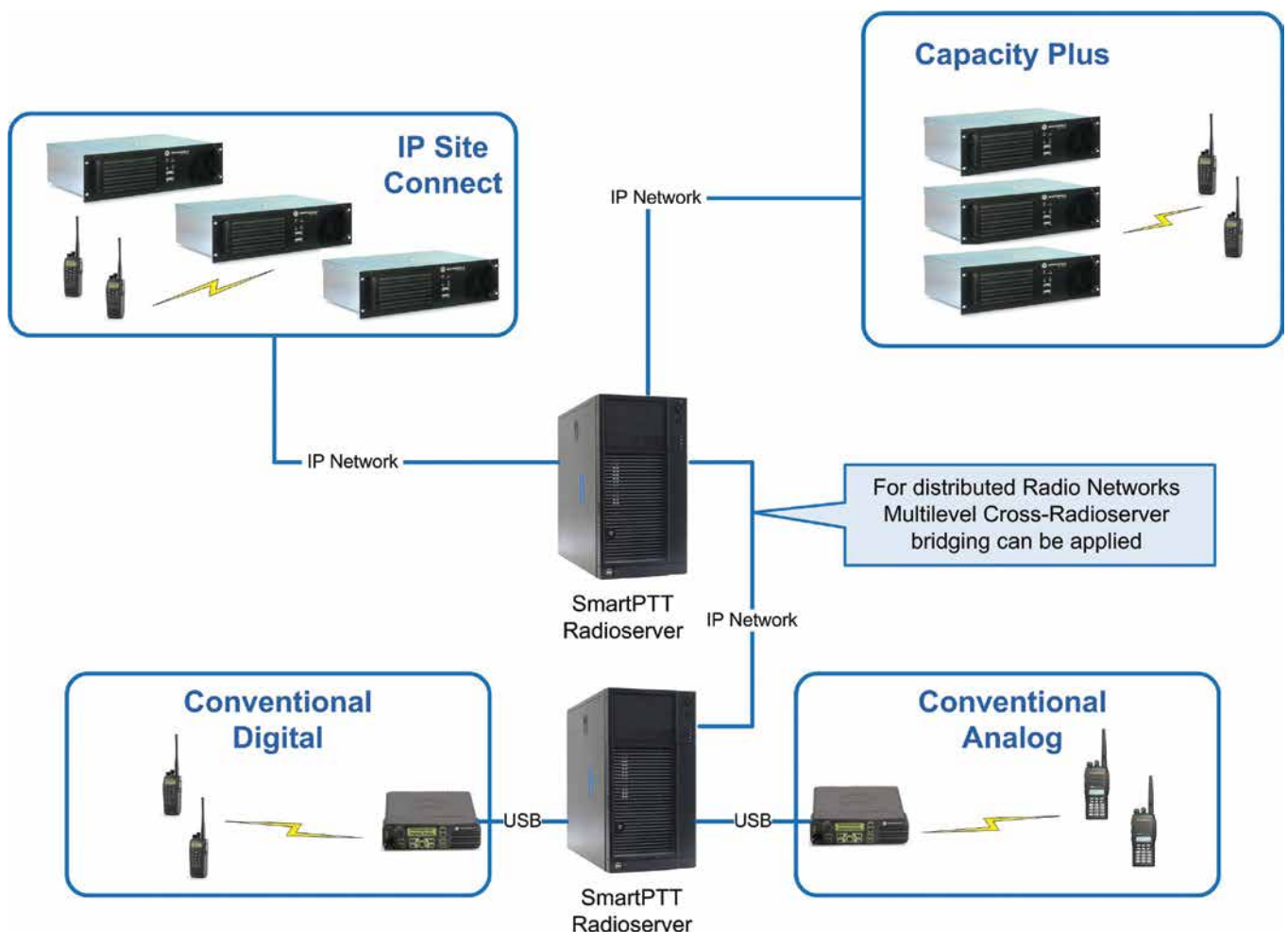


Radio Network Bridging

SmartPTT Routing Service allows call patching between multiple radio networks of the same or different type, as well as between multiple SmartPTT Radioservers. Subscribers from one network by means of SmartPTT are able to communicate with subscribers from the different network.

Patching rules (routes) are flexibly defined using the Dispatch Console. SmartPTT supports both one-way and two-way routes. Possible route types depend on the type of the connected radio networks, the typical ones are listed below.

- Routing of all calls from one network to another
- Routing of the group calls for specified talk groups
- Routing of the private calls for specified subscribers
- Dynamic intelligent routing based on the information about the subscriber registration in the network





GPS Tracking

SmartPTT allows monitoring of MOTOTRBO subscriber radios with embedded GPS-receiver.

- Real-time subscriber location monitoring
- Support for different map formats (vector, raster, web-based)
- Subscriber locations logging
- Track animation for required period
- Subscriber movement detailed report
- Geofencing, monitoring of control zones enter and exit
- Control the subscriber route
- Subscriber stop control
- Subscriber start control
- Points of Interest (POI)
- Automatic subscriber location request (time interval for location request can be specified for each subscriber individually)
- Location request by event
- Manual location request
- Export locations to KML (for location monitoring in third-party applications such as Google Earth)

The screenshot displays the SmartPTT software interface, which is divided into several functional panels:

- Top Menu:** Operators, Map, Event Log, View, Settings, Service, Reports, Help.
- Sound Panel:** Includes controls for 'All On', 'Mute All', and 'Cancel'. It also features a slider to 'Increase Sound Level for Selected Subscriber/Group' and buttons for 'RadioServer / Slot 1' and 'RadioServer / Slot 2'.
- Online Subscribers:** A list of subscribers with columns for Object, Map, and Status. It shows 'Group 1' with 'James' and 'John' as members, and 'Group 2' with 'John' as a member.
- Offline Subscribers:** A list of offline subscribers including 'Andrew', 'Christopher', and 'Larry'.
- Categories:** A section for 'Drivers' with 'Andrew' and 'Larry' listed.
- Phone Subscribers:** A section for 'All statuses'.
- Call History:** A panel showing a list of calls, including 'Group Call, Group 1 (4 sec)' and 'Private Call, John (1 min, 5 sec)'.
- Points of Interest:** A panel with 'Create', 'Save', and 'Cancel' buttons, and a 'Way to go' button.
- Map:** A large map showing the location of subscribers, with a 'John' label and a '22:01:19:02' timestamp.
- Events records count - 118:** A table showing event logs with columns for Type, Date/Time, Description, Not read, Operator, and Rad.
- Bottom Panel:** Displays details for a specific event, including 'Direction: Incoming', 'Event Type: Registration', 'Date/Time: 01/24/2013 16:16:18', 'Subscriber: 404', 'Control Station: Slot 1', 'RadioServer: RadioServer', 'Operator: Administrator', 'Status: Online', 'Duration: 404', and 'Connection Type: MOTOTRBO'.

The interface also includes a status bar at the bottom indicating 'There are unread messages: 2' and 'Enterprise 8.0.0.6370'.



Telephone Interconnect

SmartPTT software implements Telephone Interconnect Gateway to make calls between MOTOTRBO or analog radios and telephone subscribers. The gateway is the software component embedded into SmartPTT Radioserver service. Telephone interconnection is established by SIP through IP-PBX or VoIP-gateway connected to PBX or PSTN.

Telephone Interconnect Features

- Private and group radio calls from regular phone
- Multiple concurrent channels to telephone network
- Possibility to limit list of authorized radio subscribers
- Voice call recordings in MP3 format
- Full duplex phone calls from and to Dispatch Console



Phone call can be initiated in different ways.

- Dial the subscriber or talk group ID from phone
- Dial phone number from radio
- Patch of phone and radios by means of dispatch console



Text and Data Transfer

■ Text Message Service

SmartPTT Dispatcher Console allows sending text message either to individual MOTOTRBO subscriber or group. Subscribers with the radio having display and keyboard can send text message back to the Dispatcher Console.

■ Status Control

SmartPTT supports flexible list of statuses for subscribers. Every status can have its own color. Statuses can be assigned to subscribers, either from the dispatcher console or by pressing accessory button on subscriber radio. Status filter in the dispatcher console allows easy selection of the subscribers having specific status.

■ Email Gateway

- Ability for email users to send text messages to the particular subscriber or talk group in MOTOTRBO radio network
- Functionality to duplicate messages sent within the MOTOTRBO radio network to the email addresses specified in the Radioserver Configurator

■ Job ticketing tool

Job ticketing tool in SmartPTT dispatch console allows a dispatcher to assign tasks to MOTOTRBO subscribers and follow the process of task completion. Convenient ticketing table provides quick tasks filtration by their name, status, recipient, creation time, and status change time.



SmartPTT supports all functionality of native MOTOTRBO telemetry feature. Dispatcher Consoles allows controlling over GPIO contacts of MOTOTRBO subscriber radios.



Events and Voice Logging

■ SmartPTT logs all system events such as registration, voice calls, text message, status change, radio kill, telemetry signal, GPS location into database. SmartPTT uses MS SQL Server as data storage (SmartPTT setup package includes MS SQL Express free edition).

■ Voice logging in SmartPTT is done by saving sound files in MP3 format to specified folder. For those files tags are set to easily identifying and grouping of the records.

■ Distributed event and voice data storage: logging can be done on both client and server sides of the system.

■ Event viewer in SmartPTT Dispatcher Console has embedded functionality to filter, group and sort records displayed in the viewer. Besides that the flexible report engine is implemented in SmartPTT. It is possible to build different types of reports such as subscribers' activity, subscriber's location and past movement, channel loading.

■ SmartPTT supports customized rules for event processing on both server and client side of the system.



Web Client

SmartPTT Web Client is an application for convenient subscriber control and monitoring from a browser. Web Client comes as a part of basic configurations of SmartPTT Enterprise and SmartPTT Basic and provides all common functionality of dispatch consoles.

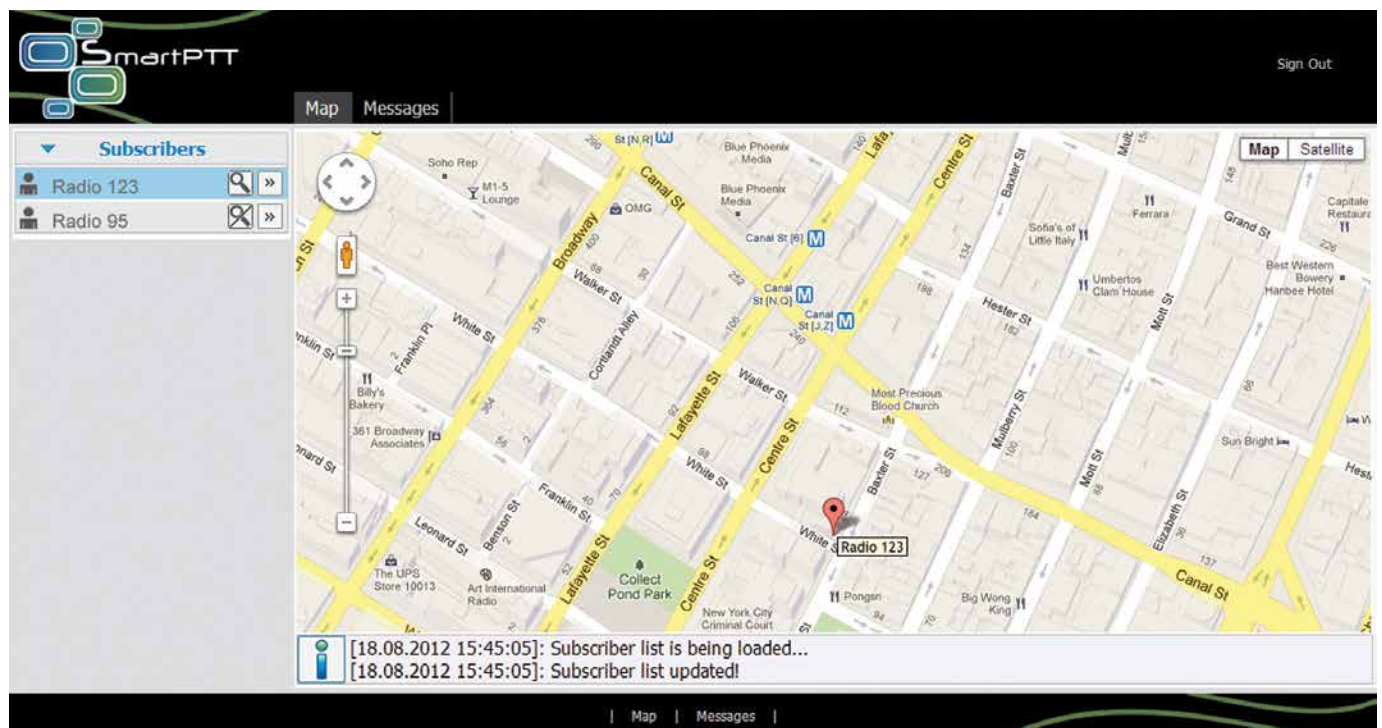
SmartPTT Web Client Features

- Voice calls from browser
- Radio check and radio kill
- Real-time GPS monitoring with detailed report
- Text message exchange
- Subscriber registration

Supported Systems

- Standalone repeater
- IP Site Connect
- Capacity Plus
- Linked Capacity Plus
- Connect Plus
- Conventional Networks

SmartPTT Web Client provides a great opportunity to instantly send a message, check subscribers' location or make a voice call from a PC that doesn't have a dispatcher application installed on it.



Modern dispatch control system is not only hardware. Nowadays software plays a key role in the system. It realizes the potential of hardware platform and provides an ultimate adaptation of dispatch system functionality to meet the requirements of every particular user.

SmartPTT

- facilitates the construction of a complex dispatching system
- includes all benefits of the MOTOTRBO digital platform by Motorola

SmartPTT Users

Mobile subscribers use MOTOTRBO radios and have access to the radio network system within its coverage area.

Dispatchers use the advanced features and capabilities, e.g. communicating with mobile subscribers, as well as monitoring their activity. Dispatchers have access to the system using the dispatcher console and they are responsible for management and maintenance of the whole communication system.

Heads of departments have access to analytical information.

SmartPTT Application

Linear-extended objects

Multi-site dispatcher control systems for oil- and gas-pipelines, power grids, highways, railways, etc.

Geographically distributed objects

Dispatching systems for emergency services, municipalities, public transportation, security services, etc.

Local objects

Single-site systems for manufacturing enterprises, airports, supermarkets, hotels, etc.



